XCE0516/02

INDUS UNIVERSITY

Enrollment No: 68

INDUS UNIVERSITY

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Constituent Institutes of Indus University

Semester:	Vth sem	Branch:	CSE
END SEMESTER EXAMINATION – November 2022			
Subject Code:	CE0516	Subject Name:	Design and Analysis of Algorithms
Date:	8/11/22	Time:	3 Hrs. 2:00pm to 5:00pm
Day:	Tuesday	Total Marks:	100

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicates full marks.

Q.1	A	Give the algorithm for matrix multiplication and find the time complexity of the algorithm using step – count method.	10
	B	Write Divide – And – Conquer recursive Merge sort algorithm and derive the time complexity of this algorithm.	10
Q.2	A	State the Greedy Knapsack? Find an optimal solution to the Knapsack instance n=3, m=20, (P1, P2, P3) = (25, 24, 15) and (W1, W2, W3) = (18, 15, 10).	10
	B	What is a Spanning tree? Explain Prim's Minimum cost spanning tree algorithm with suitable example.	10
Q.3	A	Explain how Assembly Line problem can be solved using dynamic programming with suitable example.	10
	B	What is a Hamiltonian Cycle? Explain how to find Hamiltonian path and cycle using backtracking algorithm.	10
Q.4	A	Discuss the 4 – queen's problem. Draw the portion of the state space tree for n = 4 queens using backtracking algorithm.	10
	B	Explain String Matching with finite automata with suitable example.	10
Q.5		**Any Four (05*4=20)**	20
	A	Distinguish between Dynamic Programming and Greedy method.	05
	B	Distinguish between Backtracking and Branch & Bound.	05
	C	Calculate Binomial Coefficient using Dynamic Programming Approach.	05
	D	Differentiate between Depth First Search and Breath First Search.	05
	E	Explain Naive String Matching Algorithm with suitable example.	05
	F	Explain the P & NP problems. Discuss NP-Hard problems.	05